

## Nonpoint Source Pollution Abstracts

### **HOUSTON-GALVESTON REGION'S RIPARIAN BUFFER MAPPING AND INFORMATION TOOL**

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Houston, Texas

The Houston-Galveston region is experiencing a wide range of water quality impairments and concerns, many of which are linked to contaminants originating from stormwater runoff. In an effort to improve water quality, land owners have the opportunity to protect or construct riparian buffers on their property in order to naturally protect a waterway from the impact of adjacent land uses. State and Federal agencies have many funding and incentive programs available to assist and encourage land owners to implement riparian buffers on their property. However, the resources and information necessary to pursue the construction of a buffer is widely dispersed and difficult to obtain. The Houston-Galveston Area Council (H-GAC) has put together a new riparian buffer mapping and information tool that includes all required information in one online portal that land owners and other interested parties can access quickly and easily.

Included in the riparian buffer mapping and information tool is a watershed map with each watershed ranked based on the areas water quality recovery potential. The Environmental Protection Agency's (EPA) Recovery Potential Screening (RPS) tool was used to rank each watershed based on specific attributes that either improve or impair a waterways potential for water quality improvements through the use of riparian buffers. The attributes used in the RPS ranking are similar attributes that state and Federal agencies use when distributing funds to land owners. The RPS rankings may also be used to estimate potential water quality contaminant reductions based on watershed characteristics. Another feature of the riparian buffer tool is the ability for land owners to calculate the ultimate cost of implementing a riparian buffer on their property. A calculator widget will be available for users to input information pertinent to their property and better understand how the implementation of a buffer will affect their land value and annual production rates. In addition to the watershed rankings and buffer strip calculator, H-GAC's riparian buffer tool includes the contact information of local funding agencies, as well as links to application forms, incentive programs, and other resources that aid in the planning and implementation of a riparian buffer.

H-GAC will demonstrate how to use the riparian buffer mapping and information tool and walk through all its functions and capabilities. This tool will hopefully serve as a valuable resource for not only those interested in implementing a riparian buffer on their property, but also for local agencies and entities involved with regional watershed planning including work with TMDLs, WPPs, and other habitat conservation projects.

## **Wetlands in Suburbia: a response to water quality, flooding, and habitat loss in the Greater Houston region**

Mary Carol Edwards  
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Suburban sprawl in the Houston-Galveston region contributes to the destruction of natural resources, but existing low density development also provides an opportunity to reinsert functional green space into the built environment. Stormwater wetlands, one of the larger stormwater Best Management Practices (BMPs), are an example. Integrated into flood control basins, stormwater wetlands mimic the functions of natural wetlands in order to cleanse, slow or infiltrate stormwater runoff. By detaining runoff in wetland-containing flood control basins, contaminants can be removed naturally before reaching the bayous and bay. Other benefits, wildlife habitat and park space, can be developed at a stormwater wetland site as well.

Because of the region's soils, hydrology, and the legacy of coastal prairie pothole marshes, networks of recreated wetlands are an important strategy for combating non-point source stormwater pollution, flooding, and even habitat loss. Because of the low density of much of the development in the Houston-Galveston region, space for larger BMPs such as stormwater wetlands is often available. To demonstrate the benefit of this combination of factors, the Texas Coastal Watershed Program (TCWP) is implementing stormwater wetland pilot projects with a range of scales, locations, and basin types. In all areas, educational outreach and volunteer opportunities for the public, students, and municipal staff is an integral part of the project.

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I would prefer to give a presentation.

Potential topic areas: Water and Sediment Quality, Non Point Sources of Pollution, Habitat Protection, Public Participation and Education

## MAKING OUR WATERS TRASH FREE

J. Douglas Jacobson, EPA Region 6, Dallas, Texas

Trash cleanups along roads, waterways, and beaches remove millions of tons each year in the United States. However, until people change their habits, the need for these activities will not end. In 2013, the U.S. Environmental Protection Agency adopted the goal of zero loadings of trash in ten years for its Trash Free Waters program. Working with other governmental agencies, non-profits, corporations and other organizations, EPA seeks to move beyond clean up events to end improper disposal of trash materials.

EPA Region 6 developed a strategy to work with our coastal states to educate citizens about aquatic trash and its impacts and to eliminate it. It also seeks to address the issue through the Non Point Source program and utilize 319 funds to remove trash. Additionally, EPA Headquarters drove across the Gulf in the summer of 2014 and met with folks in many cities. A workplan was developed for the Gulf region, and projects are being conducted to reduce and eliminate trash.

EPA continues to support clean up events, and it sponsors many through the National Estuary Programs, local events, and the Coastal CleanUp which has been sponsored by the Ocean Conservancy for more than 25 years. Other efforts are important links, as well, such as the partnership with Texas Audubon to reduce plastics and monofilament line that imperils birds. Even more important is working to make citizens aware of the impacts of trash and change their behaviors – end littering and increase recycling – which the Back The Bay campaign is working to achieve.

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I would prefer to make an oral presentation on the same panel of the Non Point Source Pollution track with and before Texas Audubon's presentation on bird entanglements and GBEP's presentation on the Back The Bay campaign. A poster would be acceptable.

## **FLUSHING OUT ONSITE SEWAGE FACILITY (OSSF) PROBLEMS Innovative Mapping and Education Help Lead the Way**

William Merrell  
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In the Houston-Galveston region, approximately 50% of stream miles are impaired by bacteria. Failing onsite sewage facilities (OSSFs) have been identified as one of many potential sources. Through the development of Bacteria Implementation Plans (I-plans) and Watershed Protection Plans (WPPs), the Houston-Galveston Area Council (H-GAC) identified data gaps and educational shortfalls that if addressed could help lower the number of failing OSSFs in the region. H-GAC focused on two problems: 1) identifying the location of OSSFs and information about them and 2) a lack of knowledge about OSSFs by real estate professionals. Between June and August of 2010, H-GAC worked with twenty Authorized Agents to build a database that contains over 90,000 OSSF permits. Using the permit addresses and ArcGIS mapping software, all records were matched to an X-Y coordinate, and then mapped in H-GAC's geographic information system (GIS).

An analysis was conducted to establish the locations of systems installed before mandatory permitting of OSSFs. These systems, commonly referred to as "grandfathered systems," have a high propensity for failure given that they were installed without consideration to sewage yield, soil type, and climate, among other factors. In order to identify potential grandfathered systems, a model was created within GIS to identify residential properties that did not have an existing OSSF and were outside of areas served by sanitary sewer. This analysis yielded potential target areas, which contain large numbers of unpermitted or grandfathered systems in close proximity to impaired water bodies.

In October of 2012 the OSSF Information System mapping service was made available on the web. The OSSF Information System is an online mapping tool that allows access to all regional OSSF data by regional permitting and inspection professionals, water quality researchers and planners, and the general public. Layers included within the OSSF Information System are OSSFs by Agent, OSSFs by Age, OSSF density, and the residential grandfathered OSSF analysis layer.

In March of 2013, H-GAC submitted a continuing education course, *Real Estate Inspections for OSSFs* to the Texas Real Estate Commission (TREC). The course was designed to instruct real estate professionals to properly inspect OSSFs, in an effort to identify failing systems during a point of sale inspection. They are also able to educate clients on how to properly maintain OSSFs. This TREC approved course is offered free of charge. Over 80 home inspectors have attended the two courses held in the Houston area.

H-GAC's OSSF initiatives have seen participation from over twenty local entities, and have been utilized in many projects, such as the Bacteria Implementation Group I-plan, the Upper Gulf Coast Oyster Waters TMDL I-plan, the Cedar Bayou WPP, and the San Bernard WPP.

## **POTENTIAL SITES FOR STORMWATER WETLANDS IN THE CLEAR CREEK WATERSHED**

Paula Swearingen, University of Houston Clear Lake, Houston, Texas

When it rains, where does the stormwater runoff go? Historically, rainwater would flow through wetlands where plants would slow the water, allowing the water to soak into the ground and filter pollutants. Today, however, most of Houston's natural wetlands and the streams that carry the stormwater have been paved over or converted into concrete channels, which then flow into Galveston Bay. One exception is the Clear Creek Watershed. Most of Clear Creek remains as a natural creek, although it does have pollution problems. There are several potential sites for stormwater wetlands in this watershed. Stormwater wetlands are designed to simulate the natural functions of wetlands and help control flooding. One of the challenges facing organizations such as the Texas Coastal Watershed Program (TCWP) is to locate potential sites for new stormwater wetlands. The purpose of this poster is to explain what happens to stormwater, what is a wetland and why it is important, and help locate potential sites for stormwater wetlands.

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Poster presentation

EVALUATING THE EFFECTIVENESS OF LOW IMPACT DEVELOPMENT  
PRACTICES AT THE GHIRARDI FAMILY WATERSMART PARK,  
LEAGUE CITY, TEXAS

Charriss York, Texas A&M AgriLife Extension Service, Houston, TX

Dr. John Jacob, Texas A&M University, Houston, TX

The Ghirardi WaterSmart Park is the first-of-its-kind assemblage of publically-accessible and monitor-able Low Impact Development (LID) practices in the Houston-Galveston Region. This park showcases how LID can be used in a suburban setting and serves as a demonstration site for citizens, elected officials and local decision makers.

In this study, LID practices (rain garden, green roof, rainwater harvesting, and pervious pavers) were installed at the 3.75 acre Ghirardi WaterSmart Park in League City, Galveston County, Texas. This study evaluates the effectiveness of LID in reducing nitrogen, phosphorus and bacteria found in stormwater on the Texas Gulf Coast in a suburban area where clayey soils and high water tables are common obstacles. The study area lies within the Clear Creek watershed which has a Total Maximum Daily Load for E. coli and is listed as impaired for both bacteria and dissolved oxygen by the Texas Commission on Environmental Quality. All LID practices were monitored for total phosphorus, nitrite, nitrate and E. coli during rain events beginning in the fall of 2014. Results suggest that the application of LID practices reduced the overall volume of runoff from the site as well as decreases in monitored parameters.

The effectiveness of Low Impact Development (LID) practices is well established for much of the United States; however, there is a still a need to evaluate these practices in the field and to collect quantitative data on LID performance, especially in Texas and for the Gulf Coast region.

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Potential topic areas: Nonpoint Sources of Pollution, Monitoring and Research